Some thoughts and advice:

- You should expect to spend several hours on problem sets. A lot of practice problem-solving is essential to understand the material and skills covered in class. Be organised and do not leave problem sets until the last-minute. Instead, get a good start on the problems as soon as possible.
- When approaching a problem think about the following: *do you understand the words used to state the problem? what is the problem asking you to do? can you restate the problem in your own words? have you seen a similar problem worked out in class? is there a similar problem worked out in the textbook? what results/skills did you see in class that might be related to the problem?*

  If you are stuck for inspiration come to office hours, or send me an email. However, don't just ask for the solution - provide your thought process, the difficulties you are having, and ask a coherent question in complete English sentences.
- Form study groups - get together and work through problem sets. **This will make your life easier!** You must write your solutions *on your own* and *in your own words*.
- If you would like more practice then let me know.
- You **are not allowed** to use any additional resources. If you are concerned then please ask.

Do **not submit** solutions to the following problems. These are practice exercises that you should complete. They may appear as quiz problems.

1. 7, 9, 11, 13, 15, 17 in Section 1.4
2. 1, 5, 7, 11, 29, 33, 55, 59 in Section 1.8

Submit solutions to the following problems on **Friday, September 21st**.

1. Problems 52, 55, 63, 64 in Section 1.4
2. Problems 2, 3, 4, 6, 8, 9, 13, 30, 31, 35, 36, in Section 1.8.
3. Problems 46, 47, 52, 54, 57, 84, 85, 88, 89, 90, 93, 96-100 in Section 1.8
4. In this problem you will investigate the rigorous $\epsilon - \delta$ definition of the limit.

   Let $f(x)$ be a function, a be in the domain of $f(x)$. We say that $f(x)$ is **continuous at** $x = a$ if, for any $\epsilon > 0$, there exists $\delta > 0$ so that, for any $x \neq a$ in the domain of f

   $$|x - a| < \delta \quad \Longrightarrow \quad |f(x) - f(a)| < \epsilon.$$

   Recall that $|A - B|$ is the *(unsigned) distance between A and B* on the real number line so that the inequality $|A - B| < c$ is the same as writing $B - c < A < B + c$.

   We will see how to use this definition to verify $f(x) = 5x - 2$ is continuous at $x = 1$; the argument can be extended to show that $f(x)$ is continuous at *any* $x = a$. (Studying Example 3 on p.60 might be useful to you.)

   (a) Find $\delta > 0$ satisfying the property that, if $x \neq 1$ and $|x - 1| < \delta$ then $|f(x) - f(1)| < 1$
   (b) Find $\delta > 0$ satisfying the property that, if $x \neq 1$ and $|x - 1| < \delta$ then $|f(x) - f(1)| < 0.01$
   (c) Find $\delta > 0$ satisfying the property that, if $x \neq 1$ and $|x - 1| < \delta$ then $|f(x) - f(1)| < 0.0002$
   (d) Let $\epsilon > 0$ be some positive real number. Find $\delta > 0$ satisfying the property that, if $x \neq 1$ and $|x - 1| < \delta$ then $|f(x) - f(1)| < \epsilon$.